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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: John Slaby et al.

Title: AN APPARATUS AND METHOD FOR CONTROLLING ACCESS TO A SERVICE OVER A COMMUNICATIONS SYSTEM

Attorney Docket No.: 491.040US1

PATENT APPLICATION TRANSMITTAL

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

We are transmitting herewith the following attached items and information (as indicated with an "X"):

X **CONTINUATION** of International Application No. PCT/GB97/02850 (under 37 CFR § 1.53(b)) comprising:
- X Specification (39 pgs, including claims numbered 1 through 68).
- X Formal Drawing(s) (6 sheets).
- X Unsigned Combined Declaration and Power of Attorney (4 pgs).

X Preliminary Amendment (14 pgs).
X Return postcard.

The filing fee (NOT ENCLOSED) will be calculated as follows:

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TOTAL CLAIMS	67 - 20 =	47	x 9 =	$423.00
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John Slaby et al.	Examiner: Unknown
Serial No.:	Unknown	Group Art Unit: Unknown
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PRELIMINARY AMENDMENT

BOX PATENT APPLICATION
Assistant Commissioner for Patents
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Dear Sir:

Prior to examination of the above-identified patent application, please amend as follows:

09614760 : 062599

IN THE SPECIFICATION

On page 1, after the title, please insert:

--Cross-Reference to related Applications

This application is a continuation of International Patent Application No. PCT/GB97/02850, filed on October 16, 1997, all of which are incorporated herein by reference.--

IN THE CLAIMS

Please delete claims 1-68, and add the following new claims 69-135:

69. A method of remotely configuring communication apparatus for communication over a network to access a service, the method comprising the steps of:

connecting said communication apparatus to said network;

said communication apparatus automatically communicating with a remote configuration system over said network using initial configuration data;

said communication apparatus transmitting unique identification information to said configuration system;

at said configuration system determining configuration data for said communication apparatus;

transmitting said configuration data to said communication apparatus;

storing said configuration data received from said configuration data in storage means in said communication apparatus;

controlling subsequent communications by said communication apparatus over said network using the stored configuration data;

transmitting subsequent configuration data to said communication apparatus automatically from said configuration system;

storing said subsequent configuration data in said storage means; and

controlling subsequent communications by said communication apparatus over said network in accordance with the stored subsequent configuration data.

70. A method according to claim 69, including the steps of a user of said communication apparatus generating a request for further subsequent configuration data, and transmitting said request to said configuration system to initiate the transmission of subsequent configuration data.

71. A method according to claim 69, wherein said configuration data is transmitted over said network using a permanently open control channel associated with a plurality of data/voice channels.

72. A method according to claim 69, including the steps at said communication apparatus, of:

gathering information on the use of said service;

processing said information to generate summary information; and

periodically transmitting said summary information to a provider of said service.

73. A method according to claim 72, wherein said information is gathered in real time using a real time clock.

74. A method according to claim 72, including the step of supplying said information and/or said summary information to a user.

75. Communication apparatus for use in the method of claim 69 for interfacing a computer system to a communication network to access a service, the apparatus comprising:

first I/O means for connection to said computer system;

second I/O means for connection to the communication network;

storage means for storing unique identification information and configuration data for configuring the operation of the apparatus to access said service over said communication network;

processing means for controlling said second I/O means the first time said second I/O means is connected to said communication network to connect to a remote configuration system and to transmit said unique identification information in said storage means to the configuration system;

wherein said processing means is operable to control said second I/O means to initially receive configuration data from said configuration system, to store said initially received configuration data in said storage means, and to control access to said service by said computer system in accordance with said initially received configuration data; and

wherein said processing means is operable to control said second I/O means to receive subsequent configuration data automatically generated by said configuration system, to store said subsequent configuration data in said storage means, and to control subsequent access to said service by said computer system in accordance with said subsequent configuration data.

76. Communication apparatus according to claim 75, wherein said first I/O means comprises a local area network port for connection to a local area network.

77. Communication apparatus according to claim 75, wherein said second I/O means comprises an ISDN port for connection to one or more ISDN lines in said communications network.

78. Communication apparatus according to claim 77, wherein said second I/O means is adapted for connection to an ISDN line having a data channel (D) and a plurality of bearer channels (B).

79. Communication apparatus according to claim 77, including at least one plain old telephone service (POTS) interface for connecting a telephone to the or each ISDN line.

80. Communication apparatus according to claim 75, including user interface means for allowing a user to generate a request for further subsequent configuration data, said processing means being responsive to said request to control said second I/O means to transmit said request to said configuration system to cause further subsequent configuration data to be transmitted to said apparatus.

81. Communication apparatus according to claim 75, wherein said second I/O port means comprises an ISDN interface for connection to one or more ISDN lines of an ISDN network having one or more data channels permanently connecting said ISDN interface to the ISDN network, and for receiving said subsequent configuration data using said data channel.

82. Communication apparatus according to claim 81, wherein said ISDN interface is adapted to receive said subsequent configuration data using one or more communication channels of the or each ISDN line.

83. Communication apparatus according to claim 75, wherein said second I/O means is adapted for connection to a dedicated data communication line.

84. Communication apparatus according to claim 75, wherein said processing means is operable to gather information on the use of said service by said computer system, to process said information to generate summary information, and to control said second I/O means to periodically transmit said summary information to a provider of said service.

85. Communication apparatus according to claim 84, including real time clock means, wherein said processing means is operable to use said real time clock means to gather real time information on the use of said service by said computer system.

86. Communication apparatus according to claim 84, including user interface means to allow a user of said communication apparatus access to said information.

87. Communication apparatus according to claim 86, wherein said user interface means comprises a further I/O means.

88. Communication apparatus according to claim 86, wherein said user interface means comprises a computer program running on said processing means to allow a user of said computer system access to said summary information via said first I/O means.

89. Communication apparatus according to claim 88, wherein said user interface means comprises said processor means operating as a web server.

90. Communication apparatus according to claim 89, wherein said processing means is operable to gather and process said information using machine independent instructions for output to said user.

91. Communication apparatus according to claim 75, including encoding means for encoding said unique identification information before transmission by said second I/O means.

92. Communication apparatus according to claim 75, including decoding means for decoding said initial and subsequent configuration data received in encoded form by said second I/O means.

93. Communication apparatus according to claim 75, wherein said second I/O means includes a modem for connection to an analogue telephone line.

94. Communication apparatus for use in the method of claim 69 for communicating with a remote system over a network to access a service, the apparatus comprising:

I/O means for connection to the network;

storage means for storing unique identification information and configuration data for the operation of the communication apparatus to access said service;

processing means for controlling said I/O means the first time said I/O means is connected to said network to connect to a remote configuration system and to transmit said unique identification information thereto;

wherein said processing means is operable to control said I/O means to initially receive configuration data from said configuration system, to store said initially received configuration data in said storage means, and to control access to said service in accordance with said initially received configuration data; and

wherein said processing means is operable to control said I/O means to receive subsequent configuration data automatically generated by said configuration system, *to store said*

subsequent configuration data in said storage means, and to control subsequent access to said service in accordance with said subsequent configuration data.

95. Communication apparatus according to claim 94, including user interface means for allowing a user to generate a request for further subsequent configuration data, said processing means being responsive to said request to control said I/O means to transmit said request to said configuration system to cause further subsequent configuration data to be transmitted to said apparatus.

96. Communication apparatus according to claim 94, wherein said I/O port means comprises an ISDN interface for connection to one or more ISDN lines of an ISDN network having one or more data channels permanently connecting said ISDN interface to the ISDN network, and for receiving said subsequent configuration data using said data channel.

97. Communication apparatus according to claim 96, wherein said ISDN interface is adapted to receive said subsequent configuration data using one or more communication channels of the or each ISDN line.

98. Communication apparatus according to claim 94, wherein said processing means is operable to gather information on the use of said service by said computer system, to process said information to generate summary information, and to control said I/O means to periodically transmit said summary information to a provider of said service.

99. Communication apparatus according to claim 98, including real time clock means, wherein said processing means is operable to use said real time clock means to gather real time information on the use of said service.

100. Communication apparatus according to claim 98, including user interface means to allow a user of said apparatus access to said information.

101. Apparatus according to claim 100, wherein said user interface means comprises a computer program running on said processing means to allow access to said summary information.

102. Apparatus according to claim 101, wherein said processing means is operable to gather and process said information using machine independent instructions for output to said user.

103. Apparatus according to claim 94, including encoding means for encoding said unique identification information before transmission by said I/O means.

104. Apparatus according to claim 94, including decoding means for decoding configurating received in encoded form by said I/O means.

105. A configuration system for use in the method of claim 69 and for connection to said communication apparatus according to claim 75 via a communication network, said configuration system comprising:

I/O means for connection to said communication network, and for receiving said unique identification information from said communication apparatus; and

configuration processing means responsive to said unique identification information to determine initial configuration data for said communication apparatus;

wherein said I/O means is adapted to transmit said determined configuration data to said communication apparatus over said communications network; and

wherein said configuration processing means is operative to automatically determine updated configuration data and to cause said I/O means to transmit said updated configuration data to said communication apparatus.

106. A configuration system according to claim 105, wherein said configuration processing means is operative to determine said configuration data using said unique identification information, information on the user or users of said communication apparatus, and information on the level of service required by the user or users.

107. A configuration system according to claim 106, including obtaining means for obtaining said information on the user or users, and said information on the level of service required by the user or users.

108. A configuration system according to claim 107, wherein said obtaining means is adapted to obtain said information on the user or users, said information on the level of service required by the user or users, and expected unique identification information prior to receipt of said unique identification information by said I/O means, and said configuration processing means *is*

operative to determine said configuration data before receipt of said unique identification information using the information obtained by said obtaining means, to compare the received unique identification information with said expected unique identification, and to cause said I/O means to transmit the configuration data if there is a match in the comparison.

109. A configuration system according to claim 108, including means for storing a plurality of sets of said configuration data for a corresponding plurality of said expected unique identification information for a corresponding plurality of said communication apparatuses, wherein said configuration system can connect to a plurality of said communication apparatuses.

110. A configuration system according to claim 105, wherein said configuration processing means is responsive to a request for configuration data received by said I/O means from said communication apparatus to determine configuration data and control said I/O means to transmit said determined configuration data.

111. A configuration system according to claim 105, including decoding means for decoding encoded unique identification information received from said apparatus.

112. A configuration system according to claim 109, including encoding means for encoding said configuration data for transmission to said apparatus.

113. Apparatus for interfacing a computer system to a communication line to access a service, the apparatus comprising:

first I/O means for connection to said computer system;

second I/O means for connection to said communication line;

processing means for gathering information on the use made of said service by said computer system, for processing said information to generate processed information, and for controlling said second I/O means to transmit said processed information to a remote management system; and

storage means for storing said information and/or said processed information.

114. Apparatus according to claim 113, including clock means, said processing means being responsive to said clock means to gather said information with respect to time, to process said information periodically, and to cause said second I/O means to transmit said processed information periodically to said remote management system.

115. Apparatus according to claim 113, including user interface means to allow a user of said apparatus access to said information and/or said processed information in said storage means.

116. Apparatus according to claim 115, wherein said user interface means comprises a further I/O means.

117. Apparatus according to claim 115, wherein said user interface means comprises a computer program running on said processing means to allow a user of said computer system access to said information and/or said processed information via said first I/O means.

118. Apparatus according to claim 117, wherein said user interface means comprises said processor means operating as a Web server.

119. Apparatus according to claim 118, wherein said processing means is operable to gather and process said information for output to said user using machine independent instructions.

120. Apparatus according to claim 113, wherein said second I/O means is adapted to receive configuration data from said management system, and said processing means is operative to process said information in accordance with said configuration data.

121. Apparatus for communicating with a remote system over a network to access a service, the apparatus comprising:

I/O means for connection to the network;

processing means for gathering information on the use made of said service by said apparatus, for processing said information to generate processed information, and for controlling said I/O means to transmit said processed information to a remote management system; and

storage means for storing said information and/or said processed information.

122. Apparatus according to claim 121, including clock means, said processing means being responsive to said clock means to gather said information with respect to time, to process said information periodically, and to cause said I/O means to transmit said processed information periodically to said remote management system.

123. Apparatus according to claim 121, including user interface means to allow a user of said apparatus access to said information and/or said processed information in said storage means.

124. Apparatus according to claim 123, wherein said user interface means comprises a computer program running on said processing means to allow a user access to said information and/or said processed information.

125. Apparatus according to claim 124, wherein said processing means is operable to gather and process said information for output to said user using machine independent instructions.

126. Apparatus according to claim 123, wherein said I/O means is adapted to receive configuration data from said management system, and said processing means is operative to process said information in accordance with said configuration data.

127. A method of monitoring communications between a communication apparatus and a remote system over a network to access a service, the method comprising the steps at said communication apparatus, of:

gathering information on the use of said service by said communication apparatus;
processing said information to generate processed information; and
transmitting said processed information to a remote management system.

128. A method according to claim 127, wherein said information is gathered with respect to time, processed periodically, and periodically transmitted to said remote management system.

129. A method according to claim 127, including the step of supplying said information and/or said processed information to a user.

130. Communication apparatus for the performance of communication processes over a network, comprising:

means for transmitting, in accordance with a first configuration condition of said communication apparatus, unique identification information over said network from said communication apparatus to a remote configuration system for obtaining first reconfiguration data from said remote configuration system;

means for receiving said first reconfiguration data from said remote configuration system and storing said received first reconfiguration data in said communication apparatus;

means for re-configuring said communication apparatus in accordance with said stored first reconfiguration data to place said communication apparatus in a first reconfiguration

condition to permit said communication apparatus to perform communication processes over said network in accordance with said first reconfiguration condition; and

means operable on command received from said network for:

receiving second reconfiguration data via said network;

storing said second reconfiguration data in said communication apparatus; and

further re-configuring said communication apparatus in accordance with said second reconfiguration data to place said communication apparatus in a second reconfiguration condition to permit said communication apparatus to perform communication processes over said network in accordance with said second reconfiguration condition.

131. Communication apparatus for the performance of communication processes over a network, comprising:

means for transmitting, in accordance with a first configuration condition of said communication apparatus, unique identification information over said network from said communication apparatus to a remote configuration system for obtaining first reconfiguration data from said remote configuration system;

means for receiving said first reconfiguration data from said remote configuration system and storing said received first reconfiguration data in said communication apparatus;

means for re-configuring said communication apparatus in accordance with said stored first reconfiguration data to place said communication apparatus in a first reconfiguration condition to permit said communication apparatus to perform communication processes over said network in accordance with said first reconfiguration condition;

means for receiving second reconfiguration data via said network and storing said second reconfiguration data in said communication apparatus, upon command received from said network; and

means for further re-configuring said communication apparatus in accordance with said second reconfiguration data to place said communication apparatus in a second reconfiguration condition to permit said communication

apparatus to perform communication processes over said network in accordance with said second reconfiguration condition.

132. Server apparatus for communication via a network with a plurality of reconfigurable communication devices, comprising:

means for storing a plurality of different first reconfiguration data relating to different said communication devices;

means responsive to receipt of unique identification data from a said communication device for transmitting to said communication device via said network said first reconfiguration data relating thereto for permitting said communication device to be placed in a first reconfiguration condition defined by said first reconfiguration data; and

means for transmitting to said communication devices via said network second reconfiguration data for causing said communication devices to be further reconfigured into

second reconfiguration conditions in accordance with said second reconfiguration data, on command of said server apparatus.

133. A process for configuring a communication apparatus for the performance of communication processes over a network, comprising:

transmitting, in accordance with a first configuration condition of said communication apparatus, unique identification information over said network from said communication apparatus to a remote configuration system for obtaining first reconfiguration data from said remote configuration system;

receiving said first reconfiguration data from said remote configuration system and storing said received first reconfiguration data in said communication apparatus;

re-configuring said communication apparatus in accordance with said stored first reconfiguration data to place said communication apparatus in a first reconfiguration

condition to permit said communication apparatus to perform communication processes over said network in accordance with said first reconfiguration condition; and

upon command received from said network:

receiving second reconfiguration data via said network;

storing said second reconfiguration data in said communication apparatus, and

further re-configuring said communication apparatus in accordance with said second reconfiguration data to place said communication apparatus in a second reconfiguration condition to permit said communication apparatus to perform communication processes over said network in accordance with said second reconfiguration condition.

134. A process for configuring a communication apparatus for the performance of communication processes over a network, comprising:

transmitting, in accordance with a first configuration condition of said communication apparatus, unique identification information over said network from said communication apparatus to a remote configuration system for obtaining first reconfiguration data from said remote configuration system;

receiving said first reconfiguration data from said remote configuration system and storing said received first reconfiguration data in said communication apparatus;

re-configuring said communication apparatus in accordance with said stored first reconfiguration data to place said communication apparatus in a first reconfiguration condition to permit said communication apparatus to perform communication processes over said network in accordance with said first reconfiguration condition;

receiving second reconfiguration data via said network and storing said second reconfiguration data in said communication apparatus, upon command received from said network; and

further re-configuring said communication apparatus in accordance with said second reconfiguration data to place said communication apparatus in a second reconfiguration condition to permit said communication apparatus to perform communication processes over said network in accordance with said second reconfiguration condition.

135. A process for enabling reconfiguration of a plurality of reconfigurable communication devices operable for performing communication operations over network, comprising:

storing at server means a plurality of different first reconfiguration data relating to different said communication devices;

in response to receipt by the server means of unique identification data from a said communication device transmitting to said communication device via said network said first reconfiguration data relating thereto for permitting said communication device to be placed in a first reconfiguration condition defined by said first reconfiguration data; and

on command of the server means, transmitting to said communication devices via said network second reconfiguration data for causing said communication devices to be further reconfigured into second reconfiguration conditions in accordance with said second reconfiguration data.

REMARKS

The specification is amended to add a cross reference to prior applications. The claims are amended for clarity and to remove multiple dependencies.

Please enter the above-described amendments before taking up the application for examination.

Respectfully submitted,

JOHN SLABY ET AL.

By their Representatives,

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Date April 14, 2000 By Ann M. McCrackin
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Printed Name ANN M. McCRACKIN
Signature Ann M. McCrackin

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AN APPARATUS AND METHOD FOR CONTROLLING ACCESS TO A SERVICE OVER A COMMUNICATIONS SYSTEM

The present invention generally relates to a method and apparatus for controlling access to a service over a communication system.

With the ever-increasing use of networks of computers there is an increasing need to simplify the setting up of a network and to more efficiently monitor the operation of the network.

One method by which computers can be networked over large distances is by using the telecommunications network. The prime example of this is the internet. The interconnections into the internet can either be via conventional analogue lines, via the integrated services digital network (ISDN) or via a permanent connection such as a leased line. An alternative network comprises the frame relay network that allows for high data transfers and requires a permanent connection.

A problem with interfacing to a communications network in order to access a service is that the interface apparatus must be configured for communication. Conventionally this is carried out manually requiring a user to either follow a series of steps, and/or to have

some knowledge of networking.

When a service is provided over a network, the service provider will collect and process statistics on events surrounding the usage of the service by each user. This requires the service provider to gather and process a large amount of data and if a user wishes to obtain any of the statistics related to access to the service by the user, the user must request this information from the service provider whereupon the service provider can transmit the information to the user.

It is an object of one aspect of the present invention to overcome the problem of configuring apparatus for accessing a service by providing an apparatus which can automatically configure itself.

Thus in accordance with the first aspect the present invention is concerned with apparatus for interfacing to a communication network in order to access a service wherein unique identification information which is stored in a memory is transmitted over the network to a remote configuration system the first time the apparatus is connected to the network. The remote configuration system determines appropriate configuration data which is transmitted back to the apparatus and stored for future use. The configuration data will be used

thereafter by the apparatus in order to configure the apparatus for accessing the service.

Thus this aspect of the present invention removes the need for a user to have any knowledge of networking or to have to undergo any steps in configuring the apparatus to access a service. At the time of purchase, the user will subscribe to a service whereupon a third party responsible for configuring the apparatus remotely is given information on the user, the unique identifying information for the apparatus, and possibly the level and/or type of service required by the user. The third party can comprise the service provider or any third party delegated by a service provider to provide the configuration service. Using the information on the level and/or type of service required for the user, and the unique identifying information, configuration data can thus be generated at a remote configuration system ready to be downloaded to the apparatus when it is first connected. The apparatus will be pre-configured with data which instructs the apparatus to automatically connect to the remote configuration system when it is first connected in order to obtain the configuration data. In a telecommunications network for example the initially set configuration data can cause the apparatus to dial a telephone number which connects automatically to the remote configuration system. In a fixed network

the configuration data could simply instruct the apparatus to make a connection to a particular address in the network.

The apparatus can be incorporated within a computer system to control the communications between the computer system and the service. Alternatively, the apparatus can comprise an interface between a computer system and a communications network. The computer system can comprise a single computer or a network of computers for example networked by a local area network.

The interconnection between the apparatus and the service can be made via any form of network. In one embodiment a communication connection made to the apparatus comprises at least one ISDN line. In such an arrangement a D channel can be used for permanent connection between the apparatus and the network whilst the B channels can be used as necessary for communications. In this way the D channel can allow for permanent monitoring of the apparatus by a remote system such as the service provider or some form of management system. Further, subsequent configuration data can be sent to the apparatus from the remote configuration system in order to change the configuration of the apparatus for subsequent communications. The subsequent configuration data can be sent using the D channel at any time without the user

having to make a connection using the B channels. The subsequent configuration data can either be sent as a result of a request from the user or it can be automatically sent.

It is an object of another aspect of the present invention to reduce the processing of communication information by the service provider and to reduce the flow of communication control data over the network.

In accordance with this aspect, the present invention is concerned with apparatus for communicating with a remote system over a network to access a service wherein information on the usage made of the service by the computer system is gathered, processed, locally stored, and then transmitted to a remote management system.

In one embodiment the remote management system comprises the service provider and thus by locally processing the information and only transmitting the processed information, not only is the processing requirements of the service provider reduced, but also the amount of information which must be transmitted is reduced. Further, since the processed information is locally stored, it is readily accessible by users of the apparatus.

The information which can be gathered can comprise for example the number of bytes transmitted and received, the number of frames transmitted and/or received, the number of errors, and the number of calls made over a telecommunications line.

In one embodiment the apparatus includes a clock such that the information can be gathered with respect to time and the processing can be carried out periodically to generate summary information which summarises the information on the communications made.

To allow a user local access to the processed information, a user interface is provided which can take any convenient form such as a serial interface, or more conveniently the apparatus can operate a computer program to provide the user interface which can comprise a Graphical User Interface (GUI) such as a web page. In such an arrangement a machine independent program e.g. a Java applet can be run in order to obtain the processed information and arrange it for output to the user in a graphical user interface form such a web page.

Configuration of data initially set in the apparatus, or configuration data obtained remotely in accordance with the first aspect of the present invention can determine the processing carried out on the gathered information.

Embodiments of the present invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a schematic drawing of a generalised system in accordance with an embodiment of the present invention;

Figure 2 is a schematic drawing of an arrangement using the frame relay network in accordance with an embodiment of the present invention;

Figure 3 is a schematic drawing of an arrangement using the internet in accordance with an embodiment of the present invention;

Figure 4 is a functional diagram of the apparatus in accordance with an embodiment of the present invention;

Figure 5 is a schematic drawing of the apparatus in accordance with an embodiment of the present invention; and

Figure 6 is a flow diagram illustrating the steps involved in configuring the apparatus in accordance with an embodiment of the present invention.

Referring now to Figure 1, this diagram illustrates a generalised system in accordance with an embodiment of the present invention wherein a computer system 100 is connected via an interface 200 to a network 300 in order to access a service 400. A management system 500 is

provided connected to the network 300 in order to control access to the service and to provide configuration data for the interface 200 as required.

Although the computer system 100 and interface 200 are shown in Figure 1 separately, the interface 200 can be combined within the computer system 100.

Figure 2 illustrates schematically a more specific embodiment of the present invention which utilises the frame relay network. In this embodiment computers 10 are networked over a local area network (LAN) (11) which is provided with an interface 12 which is connected to an ISDN network 13 via a basic rate ISDN (BRI) line. The ISDN network 13 is connected to the frame relay network via a primary rate ISDN (PRI) line. A remote computer system 16 is connected to the frame relay network 14 using the frame relay (FR) line and a configuration centre 15 is provided also connected to the frame relay network 14 for providing configuration data to the interface 12.

In this embodiment when the interface 12 is initially installed it is configured to dial into the frame relay network 14 via the ISDN network 13 in order to obtain configuration data from the configuration centre 15. The automatic configuration capability in this arrangement

removes the necessity for the user of interface 12 to have any knowledge or understanding of the network to which the interface 12 is being connected. The interface 12 is initially configured (factory set) to connect to the configuration centre 15 which will have been provided with information on the service required by the user of the interface 12 and the unique serial number of the interface 12 e.g. at the point of purchase. In this way once the interface 12 has connected to the configuration centre 15, it will transmit its unique serial number whereupon the configuration centre 15 will determine e.g. look up the required configuration data for transmission back to the interface 12. Once the interface 12 has received the new configuration data, this can be used for all future communications in order to connect to the remote computer system 16. The re-configuring of the interface 12 can take place by a re-initialisation of the interface 12, by a reloading of the controlling software and configuration data, or simply by re-reading the configuration data.

Figure 3 illustrates an alternative embodiment of the present invention wherein computers 1 are connected over a local area network which in this embodiment comprises an ethernet 2. A router 3 is connected to the ethernet 2 to interface the ethernet 2 to the internet 4. A service provider 9 is connected to the router 3 via the

internet 4 and a configuration system 5 is also connected to the internet 4 and accessible to the router 3. The configuration system 5 is provided with a database 6 of configuration data for each router serial number. Also Figure 3 illustrates the presence of a service provider's management system 7 and a customer's database 8.

The operation of this system will now be described with reference to the flow diagram of Figure 6. When the router 3 is purchased or soon thereafter and before first connection to access the service, the user registers with the service provider. The registration takes the form of providing the service provider with the serial number of the router, details of the user, and possibly information which identifies the level or type of service required from the provider. Of course, where the provider only provides one level of service i.e. a simple connection, there is no need for this information since it is assumed that if the user is registering connection is required. Such information provided to the service provider is typically held in a customer database 8. The service provider's management system 7 will contain the customer details not just for the purposes of configuration, but also for general management purposes such as billing. The information can then be passed from the service provider's management system 7 into the configuration system 5 which can comprise a separate

computer. Alternatively, the functions of the configuration system 5 and the service provider's management system 7 could be combined. With the information on the level and/or type of service required and the serial number of the router, the configuration system can then determine suitable configuration data and install this in the database 6. Of course, as new routers are purchased for use in accessing the service, this process of determining suitable configuration data will be repeated to build up the database 6.

When the router is connected to the internet via for example an ISDN line, the router automatically dials the configuration system and when the connection is made it transmits its unique serial number. The serial number can be encoded for security purposes before being transmitted. When the configuration system receives the serial number, if it is encoded it is decoded and it then goes through a verification process to determine whether it is a valid serial number. If validation is successful the configuration system refers to the database 6 to look up the appropriate configuration data which is then transmitted to the router 3 for storage in the local memory. The transmitted configuration data can be suitably encoded before transmission for security purposes. The connection by the router to the configuration system 5 can then be terminated and the

router can then configure itself in accordance with the newly downloaded configuration data. This can be achieved by a re-initialisation of the router, a reloading of the control software and configuration data, or simply by re-reading the configuration data. Once this has been carried out, the router is now configured for future access to the service provided by the service provider 9 i.e. the configuration data has set up the router to dial the correct telephone number to be connected to the service provider, it has loaded a user name and password into the router for transmission to the service provider, and it has set up other connection parameters required for communication between the router and the service provider.

Since in Figure 3 the router 3 comprises a LAN access router, users of the computers 1 looking to access the services of the service provider 9 will be able to do so seamlessly via the router 3. None of the users of the computers or the network manager of the local network need carry out any steps in configuring the LAN access router initially. Also, it is possible for the configuration system 5 to amend or update the configuration data in the router 3 remotely without the need for the local users or local network manager to do anything. One reason for updating the configuration data may be that the connection parameters have changed e.g.

the telephone number for the service provider is changed or the data rate. In such circumstances the configuration system 5 may automatically download new configuration data to the router 3 for subsequent use. Alternatively, where a service provider 3 provides different levels of service or possibly even a different service provider is required by the user of the router 3, the user will have contacted the service provider requesting a new or updated level of service. This will of course result in new or updated configuration data in the database 6 which will be automatically downloaded to the router 3. It may also be possible for the user of the router 3 i.e. the local network management to make an online request for updated configuration data.

In this embodiment the connection between the network 4 and the router 3 can be via any form of convenient communication line e.g. a conventional analogue line, an ISDN line, or a permanent communication line. If the communication line is analogue, of course the router will include a modem. Where an ISDN line is available, this will provide a high data rate without the cost of a permanent line. Also, since an ISDN line includes a data (D) channel which can be permanently open for communications of data, the configuration system 5 can use the D channel for downloading configuration data to the router 3.

The configuration system 5 can comprise a workstation running a configuration setup application. The database 6 can be provided within the workstation using any suitable database software such as Microsoft's SQL database software. In order to provide a convenient interface to the user the server can run Microsoft's Internet Infoserver to provide a web interface. The workstation will also operate as a file transfer protocol (FTP) server for the transfer of the configuration data to the router 3.

Although in Figure 3 the configuration system 5 is illustrated as being directly connected to the internet 4, the workstation may be connected to a LAN which has a router connected thereto. Any method of connecting the configuration system 5 to the internet can be used which allows for the router 3 to connect directly into it to obtain configuration data. Thus, although the configuration system 5 is most likely to be operated by the service provider, it need not be and can be operated by a third party.

In the configuration system, in order to form the configuration data there are three levels of configurations to be considered and these are (1) configuration parameters for the hardware of the router, (2) configuration parameters specific to the provider's

service and (3) parameters specific to the requirements of the user. In the specific embodiment the Microsoft Internet Information server acts as interface between the operator of the system and the Microsoft SQL database to allow for the parameters to be entered into the database to form the configuration data.

Although Figure 3 illustrates that the router 3 has only one communication line to the internet, it may have a number of communication lines for simultaneous communication to a number of service providers and possibly to a number of configuration systems. Thus, the router 3 will be capable of storing within its memory a configuration file for each communication line which communicates to a service provider. Further, the router may not be limited to a single service provider and thus more than one set of configuration data may be provided (or a set of configuration data with options for different service providers) can be stored within its memory and the router may enable a user to select the service provider to be accessed.

Although Figure 3 illustrates the router as interfacing a local area network to the internet, the router 3 may in fact comprise a simple interface between a single computer system and the internet.

In a conventional network arrangement when a service provider provides a service over the internet to a user, it gathers statistics (i.e. information on events caused by access made by the user) and processes this raw statistical data into more useful summary data. This conventional method of gathering statistical information requires the service provider to continuously retrieve data from the user which stores the raw gathered statistics locally. If a user required summary information it was necessary previously to request this information from the service provider who would then download it to the user. The present invention overcomes the limitations of the prior art by providing for local processing of the gathered statistics so that this information can be made available locally and can be periodically uploaded to the service provider. Thus, the amount of information which needs to be passed up to the service provider is reduced, the processing load of the service provider is reduced, and processed statistics are readily available to the user.

In an embodiment of the present invention a manager of the router 3 such as a local area network manager is provided with a user interface which can comprise a web server allowing any one of the computers 1 to enter a URL to access a web page which will display the processed statistics. The processed statistics available to the

user can be processed in accordance with machine independent code which conveniently comprises a Java applet. In addition to this method of interfacing using the local area network 2, the router 3 can be provided with a serial interface to allow local management e.g. the entry of configuration data or to obtain statistics.

In the router a log file is formed in memory which records each communication event and parameters of each event. These parameters can be accessed locally via the user interface and are processed to form summary information which is also available locally via the user interface. The processed statistics will periodically be transmitted to the service provider. The statistics can comprise the number of bytes transmitted and received, the number of frames transmitted and received, the number of errors, and the number of calls made. The configuration file which is remotely downloaded and includes parameters specific to the service provider, will determine how often the raw statistical data is captured, what raw statistical data should be captured, and how many samples are to be kept. The number of variables and number of samples to be kept are limited by the memory capacity of the router 3 and this will be taken into consideration by the configuration system during the formation of the configuration data since it will have all the information necessary to form the

appropriate configuration data.

The statistical processing is carried out by capturing events and synchronising these events with the operation of a real time clock. This generates a table of raw statistical data. When the table of raw statistical data is full, the data is processed in accordance with the configuration data to form summary data in a summary table. It is this summary data in the summary table which can be viewed by the user interface and the type of user interface can be determined by the configuration data.

Referring now to Figure 4, there is illustrated a functional diagram of the router 3. A LAN port 30 interfaces the router 3 to the LAN. A route 32 is provided for communications which are to be routed to/from the LAN from/to the service provider and an ISDN port 35 is provided for interface to the telecommunications network. A factory configuration 33 is initially set within the router which initiates an auto-configuration process 34 which causes the router to dial the remote configuration system and transmit its unique serial number. Configuration data 37 is thus received a process 36 for configuring the router configures it for future communications. For all future communications a log function 40 logs communication

events to form log data 38. This forms part of the raw statistical data 43 which is processed by a statistics processing procedure 42 to generate processed statistics 41. A user interface 31 provides access for a user to the raw statistical data, the log data, and the processed statistics. The type of user interface is initially dependent upon the factory configuration and subsequently to the downloaded configuration data. The processed statistics 41 is not only available to the user interface 31, it is also available via the ISDN port 35 to the service provider.

Figure 5 illustrates schematically the structure of the router 3 in accordance with an embodiment of the present invention. A LAN interface is provided for connection to a LAN. The interface provides a network manager with access to the raw and processed statistical data and also allows for users to access the service provided by the service provider. A serial interface 26 is also provided for management and allows a manager to access not only the raw and processed statistical data but also the configuration data.

A real time clock 20 is provided for timing the recordal of events to form the statistical data for processing by the central processing unit 21. A dynamic random access memory 22 is also provided to act as the working memory.

Flash memory is provided for storing the programs for carrying out the configuration of the router, for carrying out the statistical processing, for routing the communications and for providing the user interface. Also the configuration data is stored in the flash memory 23. This can comprise the initial factory configuration data and one or more sets of subsequently downloaded configuration data. Also, the serial number is stored in the flash memory 23. A battery-backed static RAM 24 is also provided for storing the statistical data such as the event log and the call log. An ISDN interface 29 is provided for interfacing to a basic rate ISDN (BRI) line and two plain old telephone service (POTS) interfaces 27a, 27b provide two analogue telephone lines (one for each of the two B channels of the BRI line) for use by telephones 28a and 28b.

Although the present invention has been described hereinabove with reference to specific embodiments, the present invention is not limited to such embodiments and variations will be apparent to a skilled person in the art. For example, although the interface to a computer system has been described with reference to a LAN interface, any interface can be used e.g. a serial interface such as an RS232 interface or a USB (universal serial bus). Further, more than one interface can be provided both to the computer system and to communication

lines. The communication lines can be any form of network communication lines such as a permanent leased line, an ISDN line, or a simple analogue line. Also, different services may be available for users on different communication lines provided for by different communication data for those lines.

CLAIMS:

1. Apparatus for interfacing a computer system to a communication line to access a service, the apparatus comprising:

first I/O means for connection to said computer system;

second I/O means for connection to the communication line;

storage means for storing unique identification information and configuration data for configuring the operation of the apparatus to access said service over said communication line;

processing means for detecting the first time said second I/O means is connected to said communication line and for controlling said second I/O means to connect to a remote configuration system and to transmit said unique identification information in said storage means to the configuration system;

wherein said processing means is operable to control said second I/O means to receive configuration data from said configuration system, to store said configuration data in said storage means, and to control access to said service by said computer system in accordance with said configuration data.

2. Apparatus according to claim 1 wherein said computer

system comprises a local area network (LAN) and said first I/O means comprises a LAN port.

3. Apparatus according to claim 1 or claim 2 wherein said communication line comprises one or more ISDN lines and said second I/O means comprises an ISDN port.

4. Apparatus according to claim 3 wherein said second I/O means is adapted for connection to an ISDN line having a data channel (D) and a plurality of bearer channels (B).

5. Apparatus according to claim 3 or claim 4 including at least one plain old telephone service (POTS) interface for connecting a telephone to the or each ISDN line.

6. Apparatus according to claim 1 or claim 2 wherein said processing means is operable to control said second I/O means to receive subsequent configuration data from said configuration system, to store said subsequent configuration data in said storage means, and to control subsequent access to said service by said computer system in accordance with said subsequent configuration data.

7. Apparatus according to claim 6 including user interface means for allowing a user to generate a request for said subsequent configuration data, said processing

means being responsive to said request to control said second I/O means to transmit said request to said configuration system to cause said subsequent configuration data to be transmitted to said apparatus.

8. Apparatus according to claim 6 or claim 7 wherein said second I/O port means comprises an ISDN interface for connection to one or more ISDN lines of an ISDN network having one or more data channels permanently connecting said ISDN interface to the ISDN network, and for receiving said subsequent configuration data using said data channel.

9. Apparatus according to claim 8 wherein said ISDN lines have one or more communication channels and said ISDN interface is adapted to receive said subsequent configuration data also using one or more said communication channels.

10. Apparatus according to any one of claims 1, 2, 6 or 7 wherein said second I/O means is adapted for connection to a dedicated data communication line.

11. Apparatus according to any preceding claim wherein said processing means is operable to gather information on the use of said service by said computer system, to process said information to generate summary information,

and to control said second I/O means to periodically transmit said summary information to a provider of said service.

12. Apparatus according to claim 11 including real time clock means, wherein said processing means is operable to use said real time clock means to gather real time information on the use of said service by said computer system.

13. Apparatus according to claim 11 or claim 12 including user interface means to allow a user of said apparatus access to said information.

14. Apparatus according to claim 13 wherein said user interface means comprises a further I/O means.

15. Apparatus according to claim 13 wherein said user interface means comprises a computer program running on said processing means to allow a user of said computer system access to said summary information via said first I/O means.

16. Apparatus according to claim 15 wherein said user interface means comprises said processor means operating as a web server.

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17. Apparatus according to claim 16 wherein said processing means is operable to gather and process said information using machine independent instructions for output to said user.

18. Apparatus according to any preceding claim including encoding means for encoding said unique identification information before transmission by said second I/O means.

19. Apparatus according to any preceding claim including decoding means for decoding configuration data received in encoded form by said second I/O means.

20. Apparatus according to any preceding claim wherein said second I/O means includes a modem for connection to an analogue telephone line.

21. Apparatus for communicating with a remote system over a network to access a service, the apparatus comprising:

I/O means for connection to the network;

storage means for storing the unique identification information and configuration data for the operation of the apparatus to access said service;

processing means for detecting the first time said I/O means is connected to said network and for controlling said I/O means to connect to a remote

configuration system and to transmit said unique identification information thereto;

wherein said processing means is operable to control said I/O means to receive configuration data from said configuration system, to store said configuration data in said storage means, and to control access to said service in accordance with said configuration data.

22. Apparatus according to claim 21 wherein said processing means is operable to control said I/O means to receive subsequent configuration data from said configuration system, to store said subsequent configuration data in said storage means, and to control subsequent access to said service in accordance with said subsequent configuration data.

23. Apparatus according to claim 22 including user interface means for allowing a user to generate a request for said subsequent configuration data, said processing means being responsive to said request to control said I/O means to transmit said request to said configuration system to cause said subsequent configuration data to be transmitted to said apparatus.

24. Apparatus according to claim 22 or claim 23 wherein said I/O port means comprises an ISDN interface for connection to one or more ISDN lines of an ISDN network

having one or more data channels permanently connecting said ISDN interface to the ISDN network, and for receiving said subsequent configuration data using said data channel.

25. Apparatus according to claim 24 wherein said ISDN lines have one or more communication channels and said ISDN interface is adapted to receive said subsequent configuration data also using one or more said communication channels.

26. Apparatus according to any one of claims 21 to 25 wherein said processing means is operable to gather information on the use of said service by said computer system, to process said information to generate summary information, and to control said I/O means to periodically transmit said summary information to a provider of said service.

27. Apparatus according to claim 26 including real time clock means, wherein said processing means is operable to use said real time clock means to gather real time information on the use of said service.

28. Apparatus according to claim 26 or claim 27 including user interface means to allow a user of said apparatus access to said information.

29. Apparatus according to claim 28 wherein said user interface means comprises a computer program running on said processing means to allow access to said summary information.

30. Apparatus according to claim 29 wherein said processing means is operable to gather and process said information using machine independent instructions for output to said user.

31. Apparatus according to any one of claims 21 to 30 including encoding means for encoding said unique identification information before transmission by said I/O means.

32. Apparatus according to any one of claims 21 to 31 including decoding means for decoding configurating received in encoded form by said I/O means.

33. A configuration system for connection to said apparatus according to any preceding claim via a communication network, said configuration system comprising:

I/O means for connection to said communication network, and for receiving said unique identification information from said apparatus; and

configuration processing means responsive to said

unique identification information to determine configuration data for said apparatus,

wherein said I/O means is adapted to transmit said determined configuration data to said apparatus over said communications network.

34. A configuration system according to claim 33 wherein said configuration processing means is operative to determine said configuration data using said unique identification information, information on the user or users of said apparatus, and information on the level of service required by the user or users.

35. A configuration system according to claim 34 including obtaining means for obtaining said information on the user or users, and said information on the level of service required by the user or users.

36. A configuration system according to claim 35 wherein said obtaining means is adapted to obtain said information on the user or users, said information on the level of service required by the user or users, and expected unique identification information prior to receipt of said unique identification information by said I/O means, and said configuration processing means is operative to determine said configuration data before receipt of said unique identification information using

the information obtained by said obtaining means, to compare the received unique identification information with said expected unique identification, and to cause said I/O means to transmit the configuration data if there is a match in the comparison.

37. A configuration system according to claim 36 including means for storing a plurality of sets of said configuration data for a corresponding plurality of said expected unique identification information for a corresponding plurality of said apparatuses, wherein said configuration system can connect to a plurality of said apparatuses.

38. A configuration system according to any one of claims 33 to 37 wherein said configuration processing means is responsive to a request for said configuration data received by said I/O means from said apparatus to determine said configuration data and control said I/O means to transmit said determined configuration data.

39. A configuration system according to any one of claims 33 to 38 wherein said configuration processing means is operative to automatically determine updated configuration data and to cause said I/O means to transmit said updated configuration data to said apparatus.

40. A configuration system according to any one of claims 33 to 39 including decoding means for decoding encoded unique identification information received from said apparatus.

41. A configuration system according to any one of claims 37 to 40 including encoding means for encoding said configuration data for transmission to said apparatus.

42. Apparatus for interfacing a computer system to a communication line to access a service, the apparatus comprising:

first I/O means for connection to said computer system;

second I/O means for connection to said communication line;

processing means for gathering information on the use mode of said service by said computer system, for processing said information to generate processed information, and for controlling said second I/O means to transmit said processed information to a remote management system; and

storage means for storing said information and/or said processed information.

43. Apparatus according to claim 42 including clock

means, said processing means being responsive to said clock to gather said information with respect to time, to process said information periodically, and to cause said second I/O means to transmit said processed information periodically to said remote management system.

44. Apparatus according to claim 42 or claim 43 including user interface means to allow a user of said apparatus access to said information and/or said processed information in said storage means.

45. Apparatus according to claim 44 wherein said user interface means comprises a further I/O means.

46. Apparatus according to claim 44 wherein said user interface means comprises a computer program running on said processing means to allow a user of said computer system access to said information and/or said processed information via said first I/O means.

47. Apparatus according to claim 46 wherein said user interface means comprises said processor means operating as a Web server.

48. Apparatus according to claim 47 wherein said processing means is operable to gather and process said

information for output to said user using machine independent instructions.

49. Apparatus according to any one of claims 42 to 49 wherein said second I/O means is adapted to receive configuration data from said management system, and said processing means is operative to process said information in accordance with said configuration data.

50. Apparatus for communicating with a remote system over a network to access a service, the apparatus comprising:

I/O means for connection to the network;

processing means for gathering information on the use made of said service by said apparatus, for processing said information to generate processed information, and for controlling said I/O means to transmit said processed information to a remote management system; and

storage means for storing said information and/or said processed information.

51. Apparatus according to claim 50 including clock means, said processing means being responsive to said clock to gather said information with respect to time, to process said information periodically, and to cause said I/O means to transmit said processed information

periodically to said remote management system.

52. Apparatus according to claim 50 or claim 51 including user interface means to allow a user of said apparatus access to said information and/or said processed information in said storage means.

53. Apparatus according to claim 52 wherein said user interface means comprises a computer program running on said processing means to allow a user access to said information and/or said processed information.

54. Apparatus according to claim 53 wherein said processing means is operable to gather and process said information for output to said user using machine independent instructions.

55. Apparatus according to any one of claims 50 to 54 wherein said I/O means is adapted to receive configuration data from said management system, and said processing means is operative to process said information in accordance with said configuration data.

56. A method of remotely configuring communication apparatus for communication over a network to access a service, the method comprising the steps of:

connecting said communication apparatus to said

network;

said communication apparatus automatically communicating with a remote configuration system over said network using initial configuration data;

said communication apparatus transmitting unique identification information to said configuration system;

at said configuration system determining configuration data for said communication apparatus;

transmitting said configuration data to said communication apparatus;

storing said configuration data received from said configuration data in storage means in said communication apparatus; and

controlling subsequent communications by said communication apparatus over said network using the stored configuration data.

57. A method according to claim 56 including the further steps of:

transmitting subsequent configuration data to said communication apparatus from said configuration system;

storing said subsequent configuration data in said storage means; and

controlling subsequent communications by said communication apparatus over said network in accordance with the stored subsequent configuration data.

58. A method according to claim 57 including the steps of a user of said communication apparatus generating a request for said subsequent configuration data, and transmitting said request to said configuration system to initiate the transmission of said subsequent configuration data.

59. A method according to claim 57 wherein said subsequent configuration data is transmitted by said configuration system automatically.

60. A method according to any one of claims 56 to 59 wherein said configuration data is transmitted over said network using a permanently open control channel associated with a plurality of data/voice channels.

61. A method according to any one of claims 56 to 60 including the steps at said communication apparatus, of:

gathering information on the use of said service;

processing said information to generate summary information; and

periodically transmitting said summary information to a provider of said service.

62. A method according to claim 61 wherein said information is gathered in real time using a real time clock.

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63. A method according to claim 61 or claim 62 including the step of supplying said information and/or said summary information to a user.

64. A method of controlling communications between a communication apparatus and a remote system over a network to access a service, the method comprising the steps at said communication apparatus, of:

gathering information on the use of said service by said communication apparatus;

processing said information to generate processed information; and

transmitting said processed information to a remote management system.

65. A method according to claim 64 wherein said information is gathered with respect to time, processed periodically, and periodically transmitted to said remote management system.

66. A method according to claim 64 or claim 65 including the step of supplying said information and/or said processed information to a user.

67. Communication apparatus substantially as hereinbefore described with reference to any of the accompanying drawings.

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68. A method of controlling communication apparatus substantially as hereinbefore described with reference to any of the accompanying drawings.

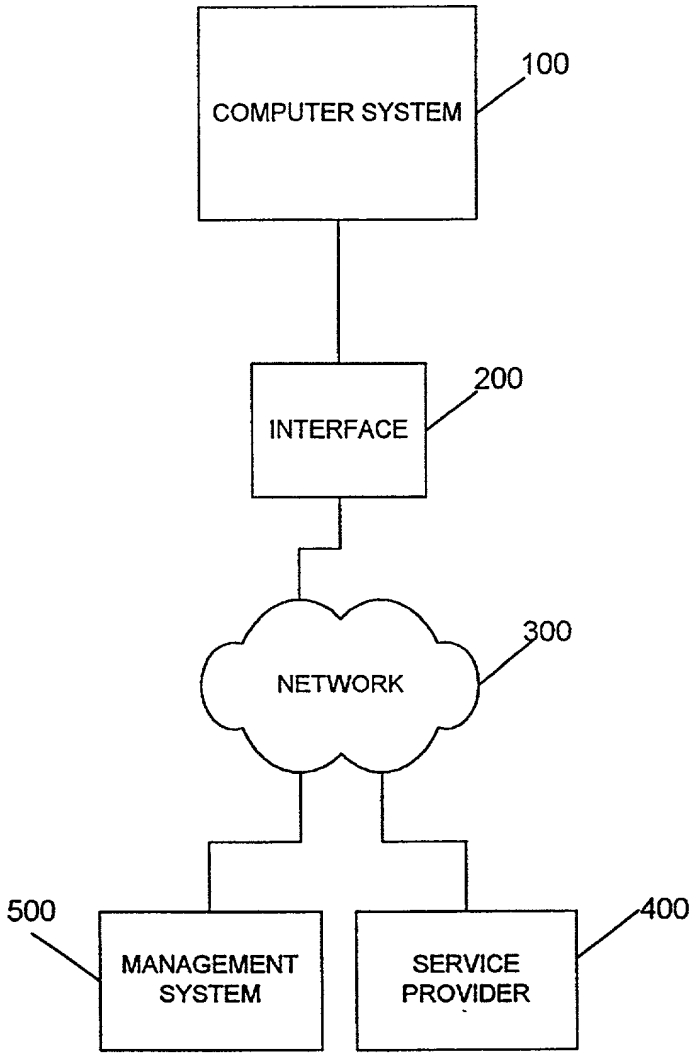

COMPUTER SYSTEM
100
INTERFACE
200
NETWORK
300
500
MANAGEMENT SYSTEM
SERVICE PROVIDER
400

Fig 1

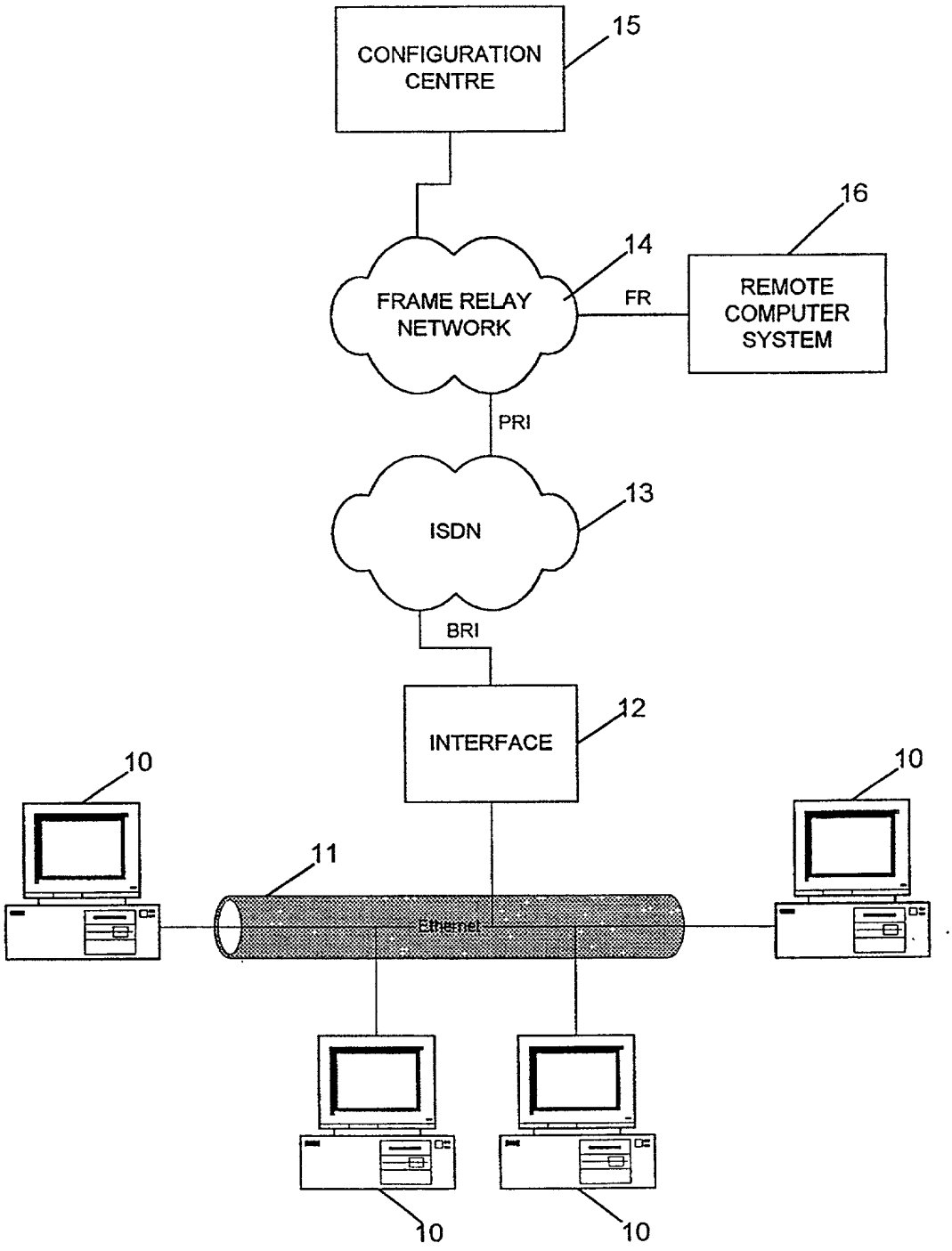
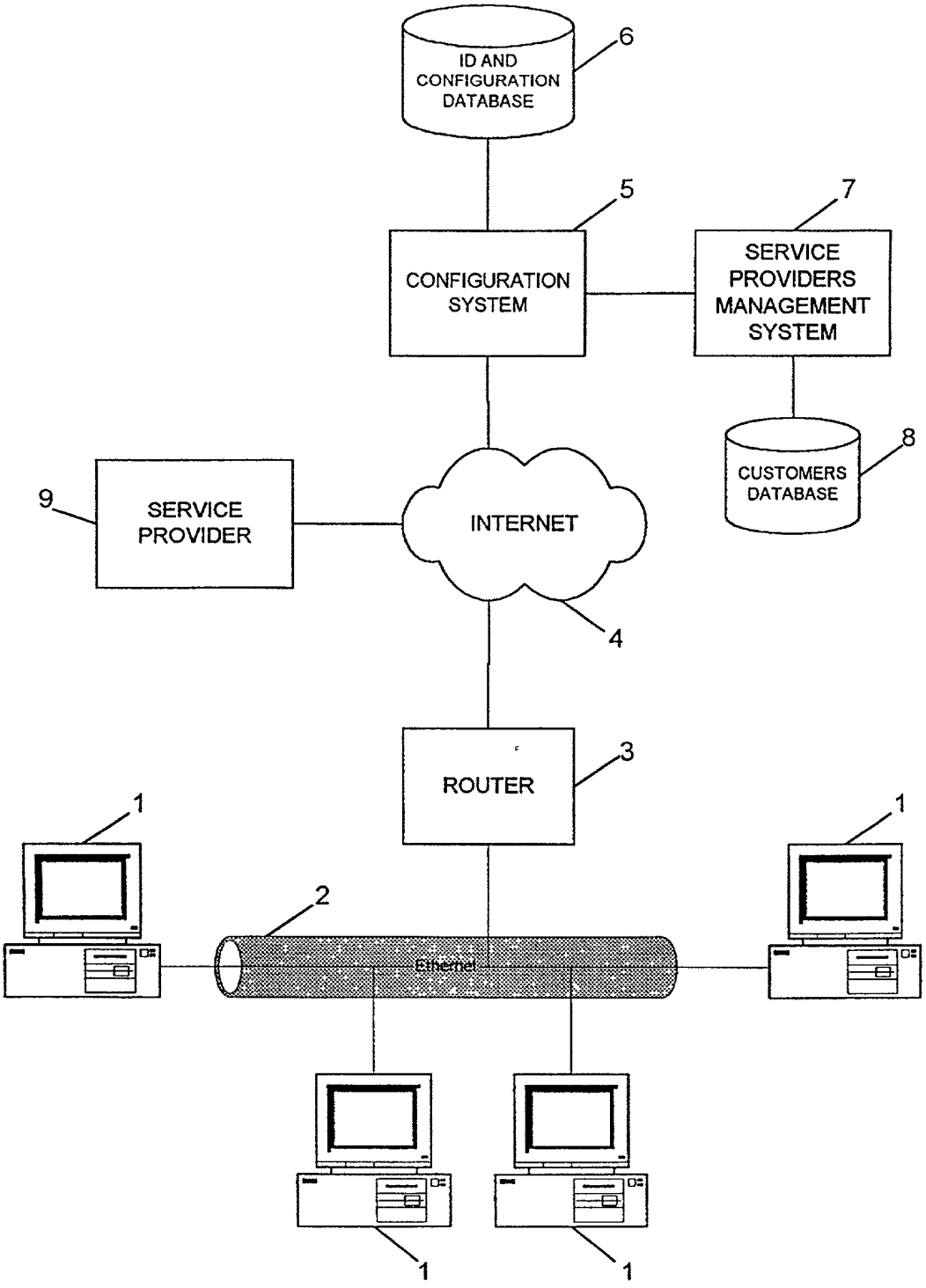

CONFIGURATION CENTRE
15
16
14
FRAME RELAY NETWORK
FR
REMOTE COMPUTER SYSTEM
PRI
ISDN
13
BRI
INTERFACE
12
10
10
11
Ethernet
10
10

Fig 2


ID AND CONFIGURATION DATABASE
6
CONFIGURATION SYSTEM
5
SERVICE PROVIDERS MANAGEMENT SYSTEM
7
CUSTOMERS DATABASE
8
SERVICE PROVIDER
9
INTERNET
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ROUTER
3
1
2
Ethernet
1
1
1

Fig 3

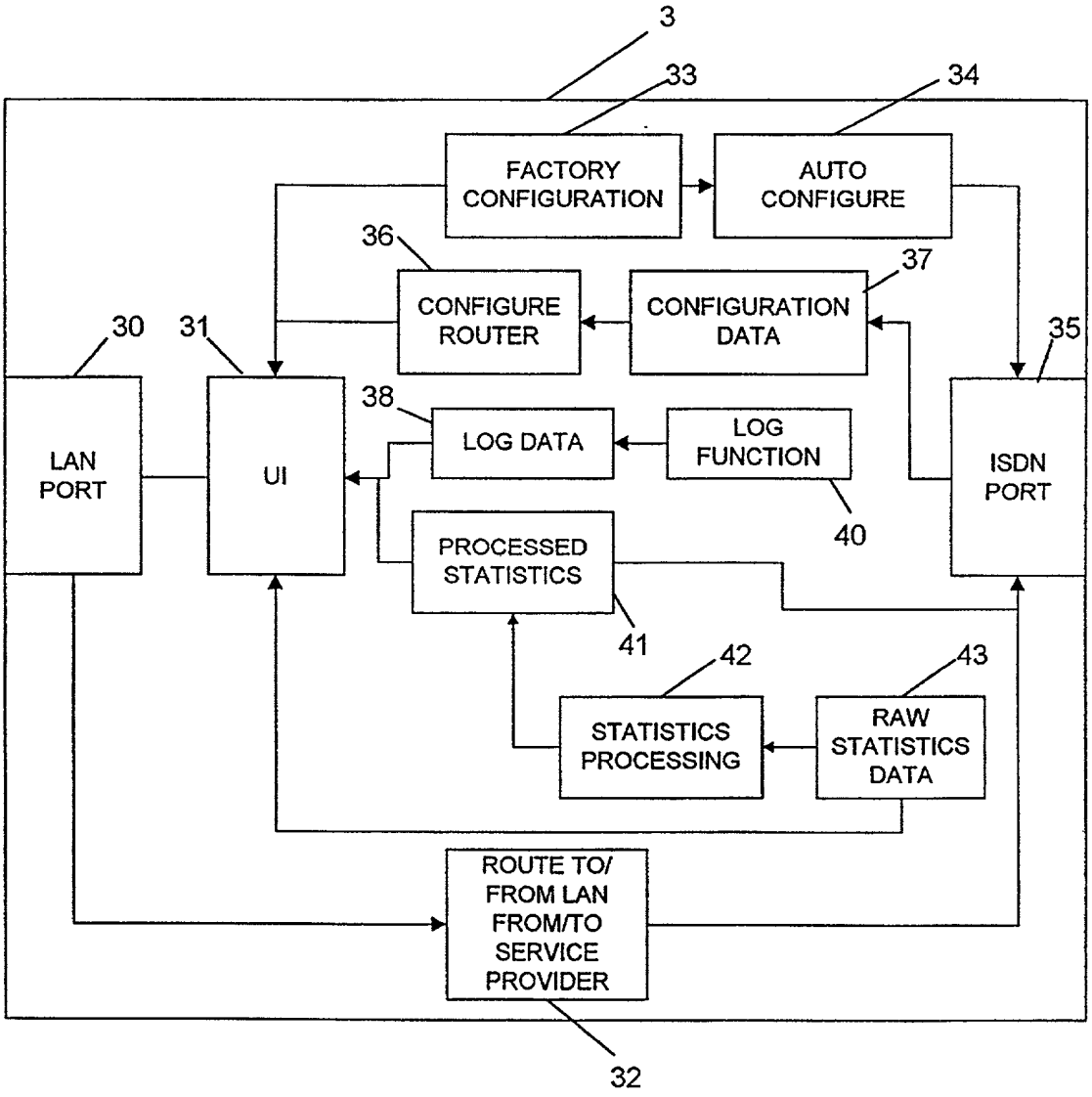
3
33
34
FACTORY CONFIGURATION
AUTO CONFIGURE
36
37
CONFIGURE ROUTER
CONFIGURATION DATA
30
31
35
LAN PORT
UI
38
LOG DATA
LOG FUNCTION
ISDN PORT
40
PROCESSED STATISTICS
41
42
43
STATISTICS PROCESSING
RAW STATISTICS DATA
ROUTE TO/ FROM LAN FROM/TO SERVICE PROVIDER
32

Fig 4

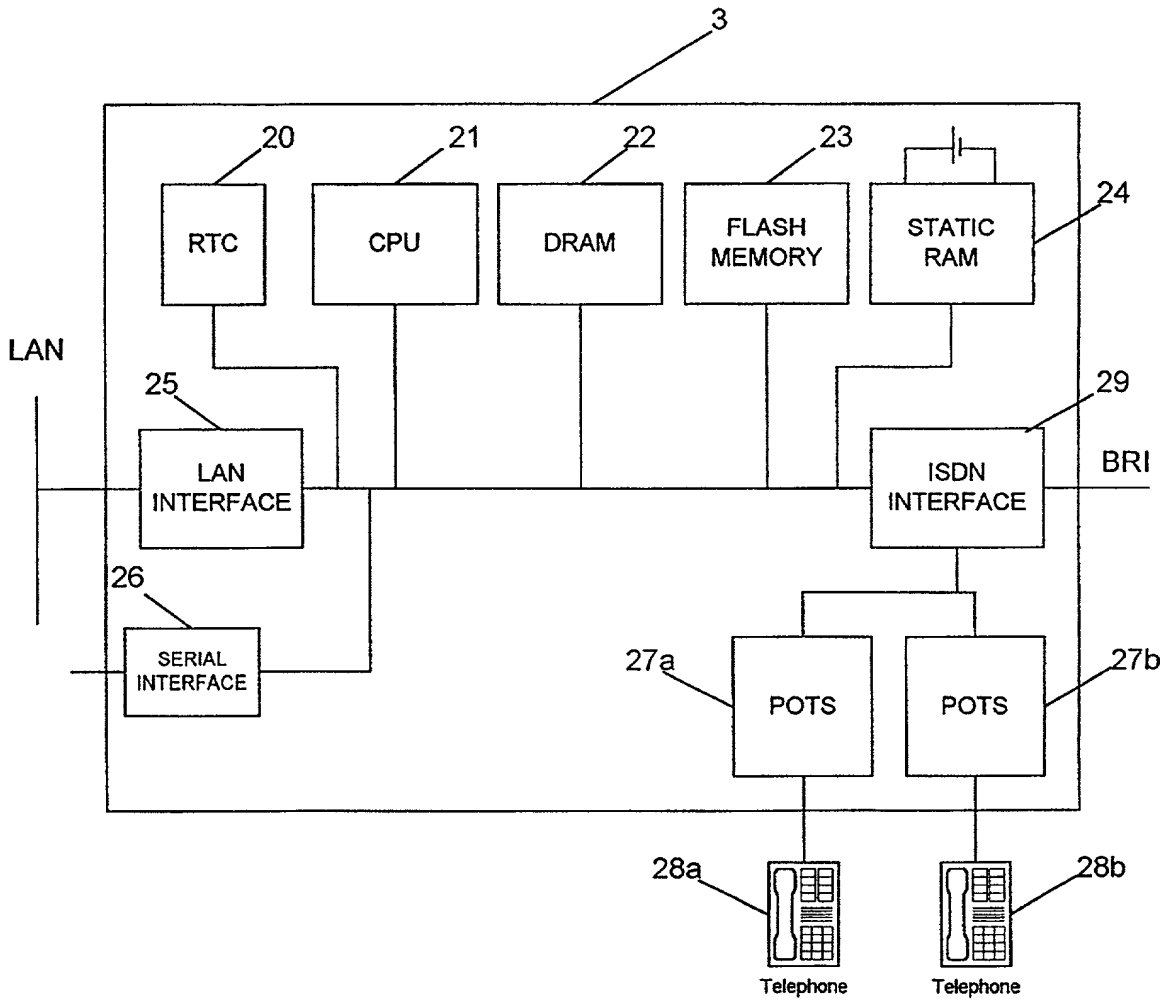
3
20
21
22
23
24
RTC
CPU
DRAM
FLASH MEMORY
STATIC RAM
LAN
25
29
LAN INTERFACE
ISDN INTERFACE
BRI
26
SERIAL INTERFACE
27a
27b
POTS
POTS
28a
28b
Telephone
Telephone

Fig 5

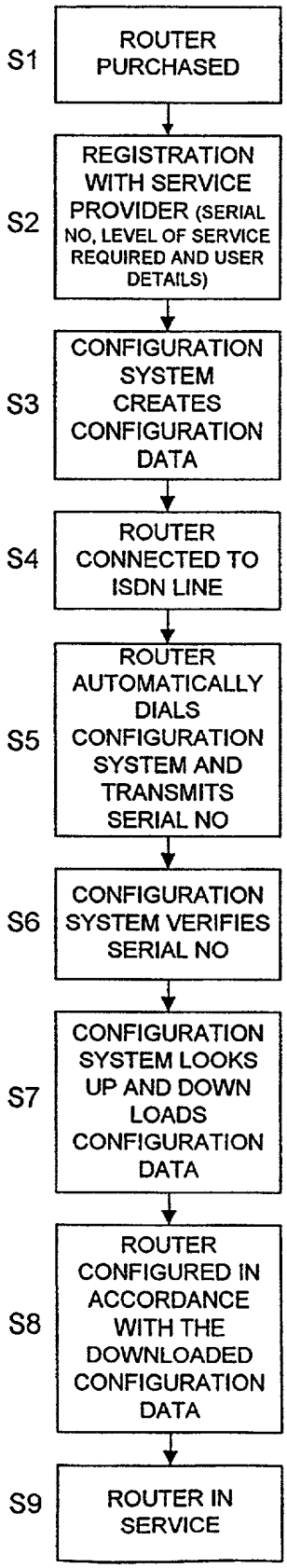
S1
ROUTER PURCHASED
S2
REGISTRATION WITH SERVICE PROVIDER (SERIAL NO, LEVEL OF SERVICE REQUIRED AND USER DETAILS)
S3
CONFIGURATION SYSTEM CREATES CONFIGURATION DATA
S4
ROUTER CONNECTED TO ISDN LINE
S5
ROUTER AUTOMATICALLY DIALS CONFIGURATION SYSTEM AND TRANSMITS SERIAL NO
S6
CONFIGURATION SYSTEM VERIFIES SERIAL NO
S7
CONFIGURATION SYSTEM LOOKS UP AND DOWN LOADS CONFIGURATION DATA
S8
ROUTER CONFIGURED IN ACCORDANCE WITH THE DOWNLOADED CONFIGURATION DATA
S9
ROUTER IN SERVICE

Fig 6

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **AN APPARATUS AND METHOD FOR CONTROLLING ACCESS TO A SERVICE OVER A COMMUNICATIONS SYSTEM**.

The specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 C.F.R. § 1.56 (attached hereto). I also acknowledge my duty to disclose all information known to be material to patentability which became available between a filing date of a prior application and the national or PCT international filing date in the event this is a Continuation-In-Part application in accordance with 37 C.F.R. §1.63(e).

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 120 or 365(c) of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Application Number	Filing Date	Status
PCT/GB97/02850	October 16, 1997	Pending

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Anglin, J. Michael	Reg. No. 24,916	Jurkovich, Patti J.	Reg. No. 44,813	Nelson, Albin J.	Reg. No. 28,650
Bianchi, Timothy E.	Reg. No. 39,610	Kalis, Janal M.	Reg. No. 37,650	Nielsen, Walter W.	Reg. No. 25,539
Billion, Richard E.	Reg. No. 32,836	Kaufmann, John D.	Reg. No. 24,017	Oh, Allen J.	Reg. No. 42,047
Black, David W.	Reg. No. 42,331	Klima-Silberg, Catherine I.	Reg. No. 40,052	Padys, Danny J.	Reg. No. 35,635
Brennan, Leoniede M.	Reg. No. 35,832	Kluth, Daniel J.	Reg. No. 32,146	Parker, J. Kevin	Reg. No. 33,024
Brennan, Thomas F.	Reg. No. 35,075	Lacy, Rodney L.	Reg. No. 41,136	Perdok, Monique M.	Reg. No. 42,989
Brooks, Edward J., III	Reg. No. 40,925	Leffert, Thomas W.	Reg. No. 40,697	Prout, William F.	Reg. No. 33,995
Chu, Dinh C.P.	Reg. No. 41,676	Lemaire, Charles A.	Reg. No. 36,198	Schumm, Sherry W.	Reg. No. 39,422
Clark, Barbara J.	Reg. No. 38,107	Litman, Mark A.	Reg. No. 26,390	Schwegman, Micheal L.	Reg. No. 25,816
Dahl, John M.	Reg. No. 44,639	Lundberg, Steven W.	Reg. No. 30,568	Smith, Michael G.	Reg. No. 45,368
Drake, Eduardo E.	Reg. No. 40,594	Mack, Lisa K.	Reg. No. 42,825	Speier, Gary J.	Reg. No. 45,458
Eliseeva, Maria M.	Reg. No. 43,328	Maeyaert, Paul L.	Reg. No. 40,076	Steffey, Charles E.	Reg. No. 25,179
Embretson, Janet E.	Reg. No. 39,665	Maki, Peter C.	Reg. No. 42,832	Terry, Kathleen R.	Reg. No. 31,884
Fordenbacher, Paul J.	Reg. No. 42,546	Malen, Peter L.	Reg. No. 44,894	Tong, Viet V.	Reg. No. 45,416
Forrest, Bradley A.	Reg. No. 30,837	Mates, Robert E.	Reg. No. 35,271	Viksnins, Ann S.	Reg. No. 37,748
Harris, Robert J.	Reg. No. 37,346	McCrackin, Ann M.	Reg. No. 42,858	Woessner, Warren D.	Reg. No. 30,440
Huebsch, Joseph C.	Reg. No. 42,673	Nama, Kash	Reg. No. 44,255		

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization/who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Schwegman, Lundberg, Woessner & Kluth, P.A. to the contrary.

Please direct all correspondence in this case to **Schwegman, Lundberg, Woessner & Kluth, P.A.** at the address indicated below:

P.O. Box 2938, Minneapolis, MN 55402
Telephone No. (612)373-6900

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Signature: _____ Date: _____
John Slaby

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Dublin 2
Ireland

Signature: _____ Date: _____
Thomas Loughlin

X Additional inventors are being named on separately numbered sheets, attached hereto.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Post Office Address: Unit 17, IDA Enterprise Centre
Pearse Street
Dublin 2
Ireland

Signature: _____ Date: _____
Henry Brankin

Full Name of inventor:
Citizenship: Residence:
Post Office Address:

Signature: _____ Date: _____

Full Name of inventor:
Citizenship: Residence:
Post Office Address:

Signature: _____ Date: _____

Full Name of inventor:
Citizenship: Residence:
Post Office Address:

Signature: _____ Date: _____

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.